



Relationship of Motor Abilities to Specific Volleyball Playing Abilities

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ABSTRACT:

It has been universally accepted that sports play a major role in developing fitness level. It not only contributes in physical development but also in strengthening integration of mind and body. The game of volleyball has been recognized as one of the leading participative sports in the world. It is impossible to determine the exact number of people actually playing the game each year. Approximately 80 countries have recognized this game as their major game. It is being played in schools, colleges, universities, clubs and institutions in India. Motor abilities are one of important aspects which underline the motor performance and physical fitness such as speed, strength, power, flexibility, endurance, coordination, balance and power. The general motor abilities and specific motor abilities play decisive role in determining one's level of performance in volleyball. The present study has been undertaken with the objectives to indentify the relationship between motor abilities and playing abilities of secondary school female volleyball players and to find out the intra correlation between selected playing abilities of volleyball. A sample of one hundred eighty (180) female volleyball players of secondary school, age group 14-19 years belonging to state of Punjab has been studied. The sample includes those players who participated in district and inter-district level tournaments. The age of each individual has been calculated up to three decimal places according to decimal calendar given by Tanner (1978) as per the date of birth and date of examination of the sampled players. The sample has been grouped in six age group of one year duration. Eleven motor abilities tests have been conducted on each subject. These tests were taken from already existing test batteries i.e. Sergeant (1921), McCloy (1954), Barrow and McGee (1964), AAHPER (1969 and 1976), Carpus TX (1977). Five Playing ability tests were selected to check their game skill performance i.e. upper hand pass, underhand pass, (Singh 1990) Target pass, service and wall volley test(AAHPER 1969). The applied formula of correlation has been taken from Garret and wood worth 1981. It has been found that majority of motor abilities have a relationship with each skill of playing ability and all playing abilities of volleyball are interrelated with each other. Volleyball performance depends on the presence of all skills in combination rather than any single skill.

Key Words: Motor abilities, Playing Abilities, Volleyball

INTRODUCTION: It has been recognized that games and sports play major role in keeping an individual physically and mentally fit. Sports not only has crucial role in physical development but also it helps in strengthening the integration of mind and body. The game of volleyball has been recognized as one of the leading participative sports in the world. It is impossible to determine the exact number of people actually playing the game each year. Approximately 80 countries have recognized this game as their major game. It is being played in schools, colleges, universities, clubs and institutions in India. Although volleyball is a popular game in India yet the level of volleyball is not on the higher side because of lack of proper training and number of controversies related with the game. It needs more efficiency of technical and tactical skills with more emphasis on fitness.

Motor ability: Motor ability is one of important aspect which underlines the motor performance and physical fitness such as speed, strength, power, flexibility, endurance, coordination, balance and power. A motor ability includes specific movements of the body's muscles to perform a certain task. The general motor abilities and specific motor abilities plays decisive role in determining one's level of performance in a wide range activities. The goal of motor skill is to optimize the ability to perform the skill at the rate of success, precision and to reduce the energy consumption required for performance. Barrow and Mc Gee (1964) defined, "it is the acquired and innate ability to perform motor skills of a general and fundamental nature exclusive of highly specialized sports or gymnastic techniques". A number of sports scientists, psychologists and coaches have started working on the various aspects of abilities which play an important role in different sports and volleyball cannot be exception."

Fitness: The term fitness is a subjective term which is associated with many other expressions such as physical, anatomical, psychological and motor fitness and motor ability. These all are different terms which are often used relatively. Thus fitness is neither a matter of more muscles nor physical capacity. It includes the realms of mental, moral, social and emotional fitness as well. According to American Association for health, physical education and recreation (AAHPER 1965), "Fitness is the state that characterizes the degree to which a person is able to function efficiently". Fitness is personal to every individual. It implies the ability of every person to live effectively with his/her potentialities. Ability to function depends upon the physical, mental, emotional, moral and spiritual components of fitness, all of which is related to one another and is mutually interdependent".

Fitness becomes the most important aspect as for as performance is concerned. Jesse (1947) states that fitness is VO₂ max which is an indication of how efficiently the tissues utilize inhaled oxygen because of the relationship between VO₂ max and distance running (cooper, 1968). Simple tests such as the 12-minute run can be used to estimate maximum oxygen uptake. Kulund et al (1982) states that cardiovascular pre season screening usually identifies serious pathological states.

Total fitness includes emotional, social and mental as well as the physical components. All components play a significant role in living a full and happy life. It has been said that fitness not only adds the years to one's life but the life to one's years. It is for all ages (Barrow, 1977). Frost (1971) says that fitness is the capacity of the individual to live and function effectively, purposefully, and zestfully and to meet confidently the problems and crises which are among life's expectations.

The objectives of the study:

The present study has been undertaken with the following objectives:

1. To identify the relationship between motor abilities and playing abilities of secondary school female volleyball players.
2. To find out the intra correlation between selected playing abilities of volleyball.

The Methodology of the study

The study is based on both primary data. The sample includes one hundred eighty (180) female volleyball players of secondary schools, age group 14-19 years belonging to state of Punjab. The sample includes those players who participated in district and inter-District level tournaments. The data has been collected through convenient random sampling method. Eleven motor abilities tests were conducted on each subject. These tests were taken from already exist test batteries i.e. sergent (1921), McCloy (1954), Barrow and McGee (1964), AAHPER (1969 and 1976), Carpus TX (1977). Some tests were modified to some extent as sit ups and pushups were taken in 30 seconds instead of one minute. 800 hundred meter and 40 meter run were taken in meters instead of yards. Five Playing ability tests were selected to check their game skill performance i.e. upper hand pass, underhand pass, (Singh 1990) Target pass, service and wall volley test(AAHPER 1969). These tests were also taken in 30 seconds.

Statistical computation of the data was made with the help of computer system. The applied formula of correlation has been taken from Garret and wood worth 1981. The coefficient correlation is a statistical measure of the strength of the relationship between the relative movements of the two variables. A coefficient of correlation is a single number that tells us to what extent two variables or things are related and what extent variations in one variable go with variation with the others or Whenever two measurements for the same individual are paired for the entire individual in a group, the degree of relationship between the paired scores is called correlation. When the perfect positive relationship exists between two variables it is described as +1 & perfect negative relationship is described as -1 and no relationship is 0(zero) .Thus the observed results must vary in between -1 to +1. In this study correlation method was applied to find out the relationship of motor abilities v/s Playing abilities of volleyball performance and intra correlation of Playing abilities of volleyball.

Significance of the study:

1. The results of present study will help the coaches in developing the deficit abilities of players.
2. The result of the study may educate the volleyball players in general about those motor abilities which affect the volleyball performance.
3. The study will help the coaches to learn the intra relationship of volleyball skills.

Age verification of the sample:

The age of each player has been calculated up to three decimal places according to decimal calendar given by Tanner (1978) as per the date of birth and date of examination. The sample has been grouped in six age groups of one year duration. Each group consists of 30 subjects. All girls who ranged from 13.500 to 14.499 years are placed in the age group of 14 years. Rest all the other groups have been constituted in similar way. The breakup of the sample according to the age has been shown in table 1.1

Table 1.1**Break up of subjects according to age groups**

Age Group	Numbers	Age range (years)	Mean age
14	30	13.500-14.499	14.131
15	30	14.500-15.499	14.972
16	30	15.500-16.499	16.026
17	30	16.500-17.499	16.926
18	30	17.500-18.499	17.968
19	30	18.500-19.499	19.049

Results and Discussion:

The present study shows the empirical findings with the help of various tests conducted on the female volleyball players of different age groups. The following table 1.1.2 and figure 1.1.2 shows the correlation between motor abilities and playing abilities of volleyball players.

Table 1.1.2

Correlation between motor abilities and playing abilities of volleyball

S.No	Motor Ability	Under hand	Upper hand	Service in different zone	Target pass	Wall Volley test
1	Standing broad jump	0.06	-0.07	0.40**	0.24**	0.24**
2	Two hand Medicine Ball Throw	0.00	-0.05	0.00	0.14**	0.17**
3	Vertical Jump	0.066	0.02	0.30**	0.30**	0.22**
4	Push Ups	0.36**	0.28**	0.16**	0.28**	0.18**
5	Right-hand Grip Strength	-0.09	-0.08	0.42**	0.13*	0.50**
6	Left Hand Grip Strength	-0.09	-0.07	0.42**	0.12	0.49**
7	800 meter Run	0.02	-0.05	0.08	0.08	0.04
8	Sit Ups	0.27**	0.24**	0.22**	0.36**	0.38**
9	40 meter sprint	-0.22**	-0.09	-0.28**	-0.29**	-0.23**
10	10*4 meter shuttle run	0.03	-0.01	-0.18**	-0.06	-0.21**
11	Forward Bend Reach	0.17**	0.08	0.12	0.26**	0.21**

*p<0.05 , **p<0.01

Fig: 1.1.2

Correlation between motor abilities and playing abilities of volleyball

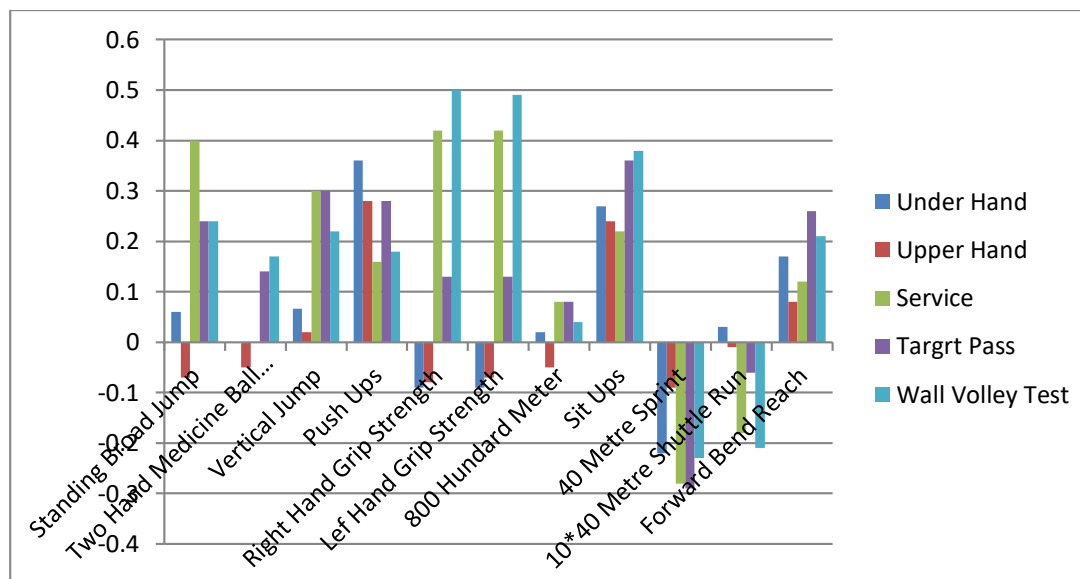


Table and Fig 1.1.2 shows the following results of the relationship of motor abilities and volleyball playing abilities:

1. Standing broad jump which is an indicator of power of legs, has positive correlation with service, under hand pass, target pass and wall volley test. The correlation values are significantly different from zero at 0.01 level of confidence. Out of these correlation maximum correlation has been observed in standing broad jump v/s service i.e., $r = 0.40$. Although this is not a very high correlation yet it enables to demonstrate that the power of legs plays positive role in volleyball performance.
2. Medicine ball throw has relationship only with target pass and wall volley test. However, these values are relatively small but the level of significance shows that the explosive power of arms and shoulders has relationship with passes and smashing ability.
3. Vertical jumps are also significantly correlated with service, target pass and wall volley test. During game a player jumps many times vertically to cross the ball over the net. The power of legs plays an important role in volleyball performance.
4. Pushups signify the relationship with all playing skills. All values are significantly different from zero at 0.01 levels. Although during game whole body involves in all skills but in each activity some muscles play it role primarily, similarly all skills are performed with arms and hands in volleyball. So, the strength of arms has major role in volleyball performance.
5. Right hand and left hand grip strength have high relationship with service and wall volley test. These results are significant at 0.01 level of confidence, whereas the value of target pass with right hand grip strength is significantly different from zero at 0.05 levels. Right hand and left hand grip strength exhibit the highest correlation with wall volley test. The existence of relationship between grip strength and volleyball skill shows that the girls of volleyball with good grip strength can perform better in game.
6. 800 meter run exhibits no relationship with volleyball performance.

7. Abdominal muscles also play an important role in the game, as sit ups are correlated with each skill of volleyball and all skills have found significant relationship. All values are more than the required ones at 0.01 level of confidence.
8. Speed (40 meter sprint) presented a significant relationship with volleyball skills except the upper hand pass.
9. The relationship of Shuttle run with volleyball skills shows that the service and wall volley tests are directly related to agility. Hence smashing also plays an important role during the game.
10. The score of forward bend reach of girls was correlated with volleyball skills to find out the relationship between flexibility and the game performance. The results show that except for upper hand pass and service all skills have relationship with flexibility.

Table 1.1.3

Intra-correlation of volleyball Playing Ability tests:

S.N	Playing Ability	Under Hand Pass	Upper Hand pass	Service	Target Pass	Wall Volley Test
1	Under Hand Pass		0.60**	0.15**	0.30**	0.03
2	Upper Hand Pass			0.06	0.25**	0.05
3	Service				0.42**	0.45**
4	Target Pass					0.50**
5	Wall Volley Test					-

**p<0.01

Fig: 1.1.3

Intra –correlation of volleyball Playing Abilities tests

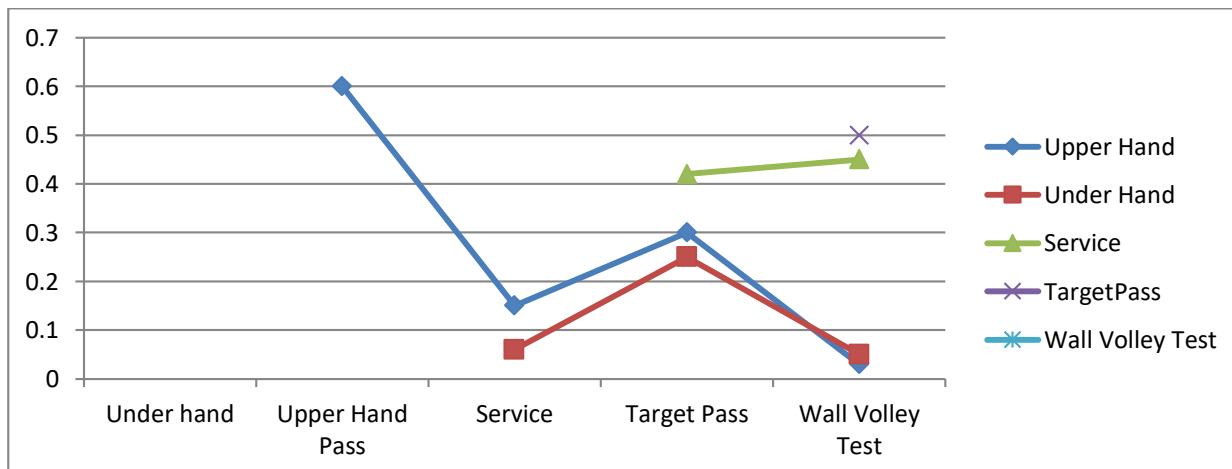


Table & Fig 1.1.3 exhibits the relationship of playing abilities with each other as following:

1. The results reveal that significant relation is obtained in case of underhand pass with each skill except wall volley test. The highest correlation is found in case of underhand pass with upper hand pass i.e. $r = 0.60$
2. The correlation of upper hand pass with each skill of volleyball demonstrates that only under hand and target pass shows the positive relationship.
3. The Service shows the significant relationship target pass, wall volley test and underhand pass.
4. The target pass exhibits the significant relationship with all skills of volleyball. All the values of relationship are significantly different from zero at 0.01 level of confidence.

Conclusion: By observing the results of table 1.1.2 and 1.1.3 it is found that majority of motor abilities have a relationship with each skill of playing ability and all playing abilities of volleyball are interrelated with each other but three skills showed lower relationship. On the basis of existence of correlation between volleyball performances it can be concluded that with good strength, explosive power, speed and agility, the performance of the players of volleyball can be improved. Secondly Volleyball performance depends on the presence of all skills in combination rather than any single skill.

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